

REMARKS

Upon entry of this amendment, which amends claims 1-4, 6-9, 11-14, 17-18, 25-27, 30-33, 35-39, 41-42, 46, 48-54, 56-57, 59-60, and 62, and adds new claims 63-76, claims 2-4, 6-19, 21-23, and 35-76 will be pending.

Claims 2-4, 35-37, 50-52, and 62 were rejected under 35 U.S.C. § 102(e) as being anticipated by Das (U.S. Patent No. 7,367,057).

Claims 6, 7, 12, 13, 14, 15, 17, 19, 21, 26, 27, 30, 39, 48-49, 55, 60, and 61 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Das in view of Nachenberg (U.S. Patent No. 5,826,013, hereinafter "Nachenberg '013").

Claims 29, 33, 46, 47, and 59 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Das and Nachenberg '013 and further in view of SimOS.

Claims 9-11, 16, 18, 22, 24, 25, 28, 31, 32, 42-44, 57, and 58 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Das and Nachenberg '013 and further in view of Nachenberg (U.S. Patent No. 6,021,510, hereinafter Nachenberg '510).

Applicants submit that no new matter has been added by the amendments.

Applicants respectfully request reconsideration of the claims in view of the amendments above and remarks below.

Interview Summary

Applicants thank the Examiner for the courtesy of the interview conducted on February 1, 2011. During the Interview, proposed amendments and the cited references were discussed. The Examiner stated that the virus detection unit of Das could be removed from the pipeline of the processor. Applicants disagree with the Examiner's assertion. Applicants have included further arguments below in support of Applicants' position.

Claim Rejections - §101

Claims 35-44 and 46-49 were rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. Applicants have amended claim 35 to include the term “non-transitory”. Accordingly, Applicants respectfully request withdrawal of the rejection.

Claim Rejections - §102

Claims 2-4, 15-19, 21-33, 48-49

Claim 2 was rejected under 35 U.S.C. §102(e) as being unpatentable over Das. Das discloses a virus detection unit 212 that includes a virus detection engine 302, authentication unit 306, and virus information unit 304. See Das, col. 5, lines 3-9. Das also discloses “the virus detection engine 302, authentication unit 306, and virus information unit 304 can be various integrated circuits, memories, and/or machine-readable media for performing operations according to embodiments of the invention. Machine-readable media includes any mechanism that provides (i.e., stores and/or transmits) information in a form readable by a machine (e.g., a computer).” See Das, col. 5, lines 27-34. The Das reference discloses the virus detection unit 212 is a functional unit in a pipeline in processor 200. See Das, col. 6, lines 42-44, Figs. 2-3.

Applicants submit that virus detection unit 212 is located in the pipeline inside processor 200 in Das. Applicants submit that having virus detection unit 212 in the pipeline inside processor 200 in Das does not disclose or suggest “a verification engine including verification instructions for execution on the at least one processor residing in the system hardware platform” and “wherein the verification engine resides in a system software layer, the system software layer performing hardware-interface and resource-allocating functions.” (emphasis added). Applicants submit that executing instructions in the pipeline inside processor 200 in Das does not disclose or suggest executing instructions in a system software layer.

Applicants have submitted an affidavit of inventors Ole Agesen, Xiaoxin Chen, and Tal Garfinkel (hereinafter “the Inventor’s declarations”) in appendix A in support of this argument. The Inventor’s declarations state:

4. If software is implemented by a functional unit in a pipeline of a processor,

the software runs in the processor. The software run in the processor includes microcode.

5. System level software is different from microcode as system level software runs on the processor in a system software layer.

6. Software implemented by the functional unit in the pipeline of the processor could not be system level software because the functional unit does not have access to the system software layer that is running on the processor from the functional unit's position in the pipeline.

Applicants submit that to the extent that virus detection unit 212 could be implemented in software not as specially-developed hardware circuitry, a person of skill in the art at the time of the invention of Das would interpret the teachings of Das to disclose that virus detection unit 212 could be implemented in software considered microcode. Microcode is executed at the system hardware layer inside processor 200. A system software layer is a different layer from the system hardware layer and performs hardware-interface and resource-allocating functions. Applicants submit statements 4, 5, and 6 from the Inventor's declarations and the above arguments show the differences between executing instructions inside the processor and executing instructions on the processor.

Also, Applicants submit it would not have been obvious to a person skilled in the art at the time of the invention of Das to implement the functions of a functional unit located in the pipeline of the system-level software. Virus detection unit 212 is located in the pipeline inside processor 200. Virus detection unit 212 is also shown as being connected with other function units inside processor 200, such as being connected to L1 instruction cache 206 and fetch and decode unit 214. Applicants submit that moving virus detection unit 212 into the system software layer would not have been obvious. This concept is supported by the Inventor's declarations. Applicants submit that the Inventor's qualifications qualify them as a person skilled in the art. Also, the Inventor's declarations state "7. It would not have been obvious to a person skilled in the art at the time of the invention of Das to implement functions of a functional unit located in the pipeline of the processor in system level software due to the functional unit being located in the pipeline."

Further, Applicants submit that to move virus detection unit 212 into the system software layer would render the invention of Das unsatisfactory for its intended purpose. "If proposed

modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).” For example, moving virus detection unit 212 into the system software layer would remove the processing of the instruction from the pipeline inside processor 200 in Fig. 2 in Das. It is clear the intended purpose of Das is to process instructions in the pipeline as evidenced by the method of Fig. 6, which describes the processing of the instruction with respect to the pipeline. Moving virus detection unit 212 would also change the principal operation of Das. “If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).” It is clear the principal operation of Das is to include virus detection unit 212 in the pipeline.

Also, based on the teaching of “various integrated circuits, memories, and/or machine-readable media” of Das, it would not have been obvious to a person skilled in the art at the time the invention of Das to implement virus detection unit 212 in a system software layer running on the processor. The above teaching of machine-readable media in Das just indicates virus detection unit 212 could be machine-readable media, but there is no suggestion in Das that if virus detection unit 212 is implemented in machine-readable media, that instructions of the machine-readable media would be executed in the system software layer. Rather, Applicants submit that Das teaches instructions would be implemented by the functional unit in the pipeline inside of processor 200.

Accordingly, Applicants respectfully request withdrawal of the rejection of claim 2. Claims 3-4, 15-19, 21-33, 48-49, and 75-76 depend from claim 2 and thus derive patentability. These claims also recite additional non-obvious and novel features. For example, claim 75 recites “the series of computable-executable instructions belong to an instruction set associated with the at least one processor and the verification instructions belong to the instruction set associated with the at least one processor.” Applicants submit that if virus detection unit 212 is implemented in software in Das, the software would be microcode. Applicants submit that microcode and the claimed verification instructions are different instruction sets.

Also, claim 76 recites the dynamically performing of the verifying is initiated from the

system software layer. In Das, the verification would be initiated from the pipeline inside the processor. It is uncertain how Das would initiate the verifying from a system software layer because virus detection unit 212 is found in the pipeline of inside processor 200.

Claims 6-7

Claim 6 was rejected under 35 U.S.C. §103(a) as being unpatentable over Das in view of Nachenberg '013. Applicants submit that Das and Nachenberg '013 do not disclose or suggest “wherein the computing of the hash value comprises applying a mask to the current page of memory, the mask being a data structure that designates at least one byte of the current page of memory to be ignored in the computing of the hash value, data structure designating less than an entire page of memory so that the hash value is based on only part of the contents of the current page of memory.” The rejection cites Nachenberg '013 as disclosing this element. Nachenberg '013 discloses page locations are accessed and scanned a byte at a time to determine whether each byte is a selected byte. See Nachenberg '013, col. 12, lines 20-43. Applicants submit that scanning a byte at a time does not disclose or suggest computing of a hash value by applying a mask to a current page of memory where at least one byte of the current page of memory is ignored in computing the hash value. It is uncertain how scanning byte by byte on a page discloses computing a hash value that is based only on part of the contents of the current page of memory. A byte does not disclose or suggest a page of memory. Further, it is uncertain how scanning a byte in Nachenberg '013 discloses a mask that designates at least one byte of the current page of memory to be ignored in the computing of the hash value. Scanning byte by byte does not disclose or suggest a mask.

Accordingly, Applicants respectfully request withdrawal of the rejection of claim 6. Claim 7 depends from claim 6 and thus derives patentability at least therefrom.

Claims 35-44, 46-47, and 50-61

Applicants submit claims 35-44, 46-47, and 50-61 should be allowable for at least a similar rationale as discussed with respect to claim 2.

New Claims 63-76

Applicants submit new claims 63-76 should be allowable over the cited references.

Conclusion

Since the cited prior art fails to teach or suggest each of the features set forth in the claims for at least the above-listed reasons, Applicants respectfully submit that the independent claims are allowable and hence a Notice of Allowance is earnestly and respectfully requested. Since each of the pending dependent claims include all the features of one of the independent claims, Applicants respectfully submit that the dependent claims are allowable for at least the reasons cited above with regard to the independent claims and further, because they further define and distinguish the invention from the prior art. Also, the above discussion of dependent claims is not exhaustive and merely presents examples of differences between Applicants' claimed invention and cited references. Applicants respectfully request independent reconsideration of the outstanding rejections of the independent claims and each of the dependent claims.

Applicants request reconsideration of the outstanding rejections and issuance of a Notice of Allowance. The Examiner is invited to contact the undersigned at 415-335-6456 to discuss any additional changes the Examiner may feel is necessary in light of this Amendment. If any other fees are due in connection with filing this amendment, the Commissioner is also authorized to charge Deposit Account No. 50-2652 (Order No. A043).

Date: 2/15/11

Respectfully submitted,

/Brian N. Young/
Brian N. Young
Reg. No. 48,602